

How Copper is Produced

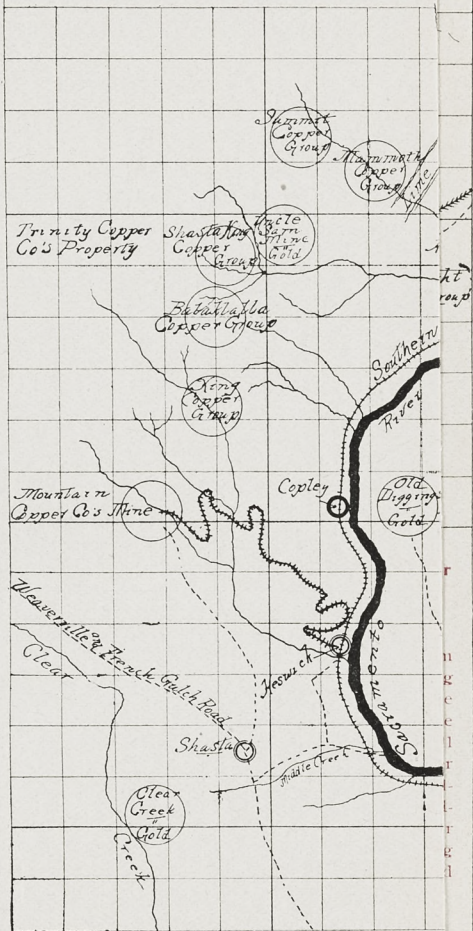
In Shasta County
Northern California



*The Shasta May Blossom Copper
Mining and Smelting Company*

Pending completion of our new offices in the Mutual Bank Building, address Rooms 205 and 207, Spreckels Annex, 713 Market Street; or, Columbian Building, 916 Market Street, San Francisco, Cal.

Property of the Shasta May Bloss
 Company in Shasta County,
 De LaMar's Great Producer



450
Lewiston
W

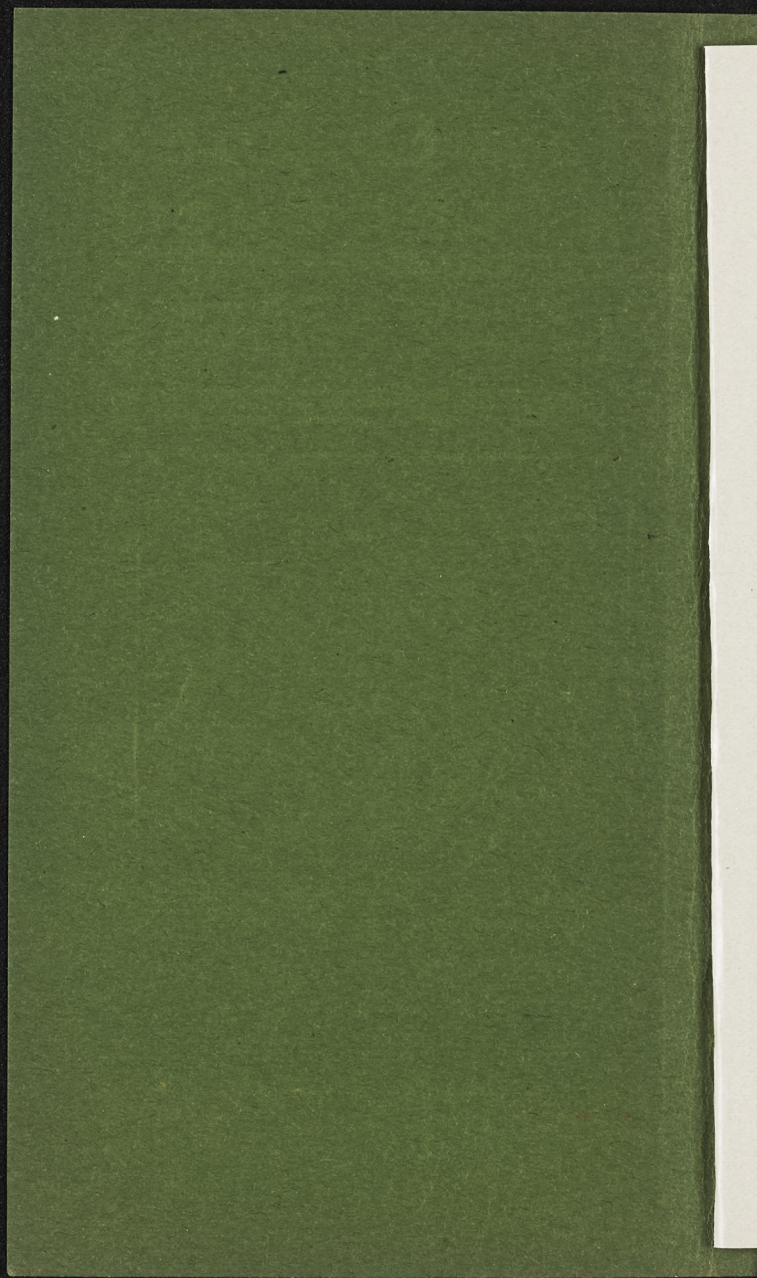
479 [Shasta May]

**The Occurrence of Copper
Ores and Method of Treat-
ment in the Production of
Copper in Shasta County,
Northern California.**



***The Shasta May Blossom Copper
Mining and Smelting Company***

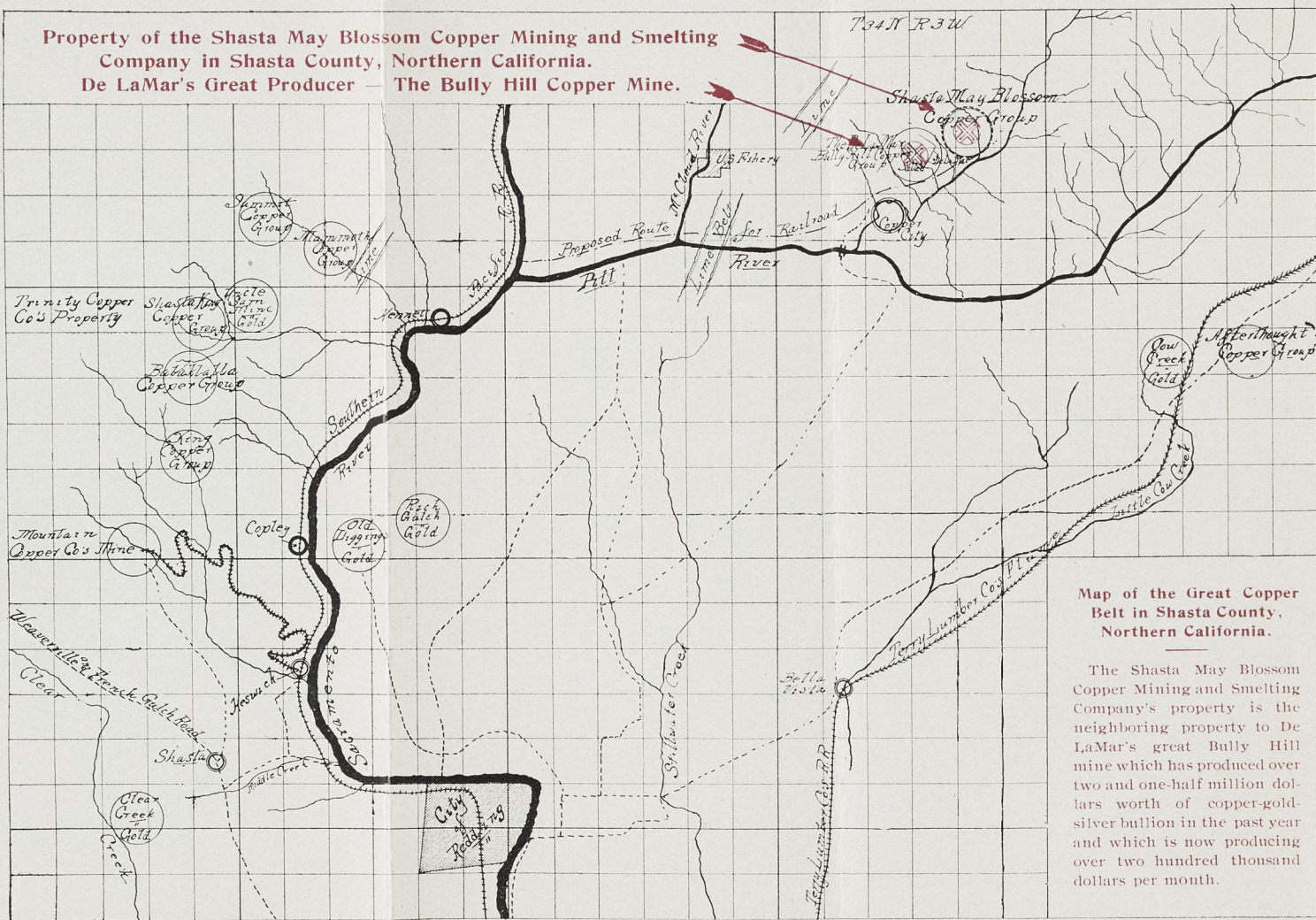
***The Standard Investment Company
Hayward Building, 488 California Street
San Francisco, California***



458

479 Shasta May 7

Property of the Shasta May Blossom Copper Mining and Smelting Company in Shasta County, Northern California.
 De LaMar's Great Producer — The Bully Hill Copper Mine.



Map of the Great Copper Belt in Shasta County, Northern California.

The Shasta May Blossom Copper Mining and Smelting Company's property is the neighboring property to De LaMar's great Bully Hill mine which has produced over two and one-half million dollars worth of copper-gold-silver bullion in the past year and which is now producing over two hundred thousand dollars per month.

450
Lyon
W
479 [Shasta May]

**The Occurrence of Copper
Ores and Method of Treat-
ment in the Production of
Copper in Shasta County,
Northern California.**



***The Shasta May Blossom Copper
Mining and Smelting Company***

***The Standard Investment Company
Hayward Building, 488 California Street
San Francisco, California***



Vein Croppings on the property of The Shasta May Blossom Copper Mining and Smelting Company.

These croppings consist of porous iron ore, generally called gossan. This gossan or iron ore was originally copper sulphide ore, but through the action of ages the copper and sulphur have both disappeared and the iron croppings now stand prominently above the surface as evidence of the existence of the vein, which below the surface becomes pay sulphide ore.

\$2,500,000 in dividends is paid annually to London, New York, and Boston Stockholders in Shasta County copper mines.

Two copper mines of Shasta County produce double as much value as all of the oil wells of California combined.

Property of the Shasta May Blossom Copper Mining and Smelting Company, in Shasta County, Northern California.

The property belonging to the Shasta May Blossom Copper Mining and Smelting Company is situated in Shasta County in Northern California, and on what is known as the great Shasta County Copper Belt. This Shasta County Copper Belt has been well known to the mining world for a period of about six years, though it has been in course of development as a copper district for a period of ten years, and as a gold district for nearly half a century. The great copper mines on this belt in their early history were operated either as gold or silver properties, or as both. The vast wealth of the different mines as known to date is in the appreciation of the true value of the almost unequalled bodies of sulphide ores, which ores but a few years ago were looked upon with greatest dread by the mine owners when searching for gold or silver bearing rock, as no method was then known in that district by which these sulphide ores could be successfully treated.

Six years ago an English company secured the Mountain Copper Company's property and by the erection of modern machinery gave to the country an understanding of the enormous wealth that exists in these sulphide ore bodies. This one company last year produced \$6,000,000 from a property which six years ago sold for \$200,000.

The remarkable success of this company has induced a most careful exploration and development of other old properties and the discovery of new ones. The district itself is more clearly understood and it is now recognized that there are at least two prominent mineral zones in the district, strongly resembling



Tunnel on the property of the Shasta May Blossom Copper Mining and Smelting Company in which the thirty-foot vein has been discovered, showing the gossan ore body in place underground. The pile of rock at right of tunnel is ore extracted from the vein.

The yearly NET PROFIT from one Shasta County copper mine is GREATER than the yearly GROSS OUTPUT of the world-famous Treadwell Alaska gold mine.

The daily gross output of one Shasta County copper mine is four times as great as the daily gross output of the Treadwell Alaska Gold Mine.

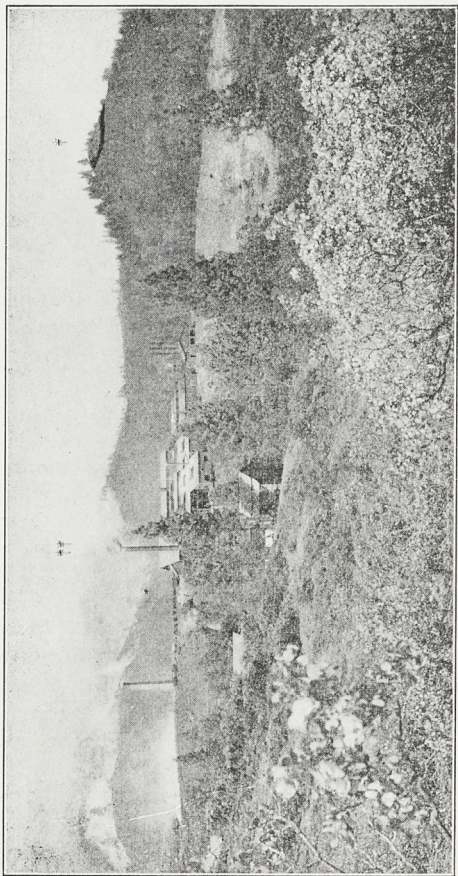
each other, but differing in detail. On the line of each of these zones the ore bodies discovered have striking characteristics belonging to their own particular zone.

These zones may be termed as the west zone and the east zone. Mentioning first the west zone, because on this was the first application of modern methods, there can now be numbered the original Mountain Copper Company's property, which has produced \$20,000,000 within the past six years; the Trinity Company's property which has upwards of \$30,000,000 worth of copper sulphide ore developed and ready for the smelters; and the Balaklala property, which has been explored by core drills until it is now known that this property contains a tonnage probably as great as that contained in either the property of the Mountain Copper Company or the Trinity Copper Company.

In all of these great properties it is noted that certain particular characteristics when associated with given rock formations have led with unerring certainty to bodies of pay sulphide ore. This is explained by the fact that these croppings were themselves, in their original creation, bodies of sulphide ore, but because near to the surface the oxidizing action of ages has permitted the withdrawal of the copper values. The pursuit of these croppings in depth, therefore, leads to a point below oxidization where the sulphide ores faithfully present themselves.

The success of the Mountain Copper Company's property induced the exploration of the western belt before close attention was directed to the eastern belt, but within the past two years the eastern belt has received its deserved attention.

On this eastern belt one property had been known for many years as a gold and silver property. Its values were found in ores identical with the vein croppings of the great western belt. This property

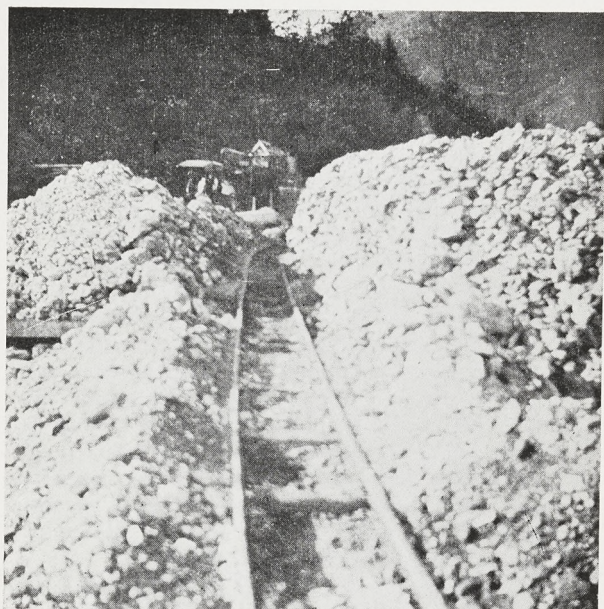


‡The property of the Shasta May Blossom Copper Mining and Smelting Company.
‡‡The De LaMar Bully Hill Smelter, which has produced two and one-half million dollars within the past year.

had a history of nearly forty years of operation as a gold and silver mine. The original workers on this mine carried their operations down, extracting their surface ore and checking their operations whenever this surface ore became sulphide. This was because of their having at that time no knowledge as to how to treat these sulphide ores, though assays of these sulphide ores proved that they contained high values. The success of the Mountain Copper Company in the western belt gave the first idea that this property in the eastern belt could also be made a success and it was reserved for the De LaMar Company to install upon it one of the best and most complete modern smelters that could be constructed, and the operation of this smelter has proved that this property, now known as the great De LaMar Bully Hill property, has a vein of almost unequalled richness, with a present actual production of more than \$200,000 per month. The first 100 days' output of the property under present methods of treating the ore equaled the entire forty years' production of the same mine under previous methods.

Magnificent as are these results yet the outcroppings of these great ore bodies on both the west and east mineral zones are rare. Every care was therefore given in deciding on the property now operated by the Shasta May Blossom Copper Mining and Smelting Company, and decision as to selection was actually made because of the unquestioned resemblance of its splendid outcroppings to the outcropping ore bodies which have been developed with such success on the west zone, and which, on the east zone, have led to the opening of the great Bully Hill vein, under which croppings in these other properties millions of dollars in value have been exposed in the developed masses of the deeper sulphide ores.

In formation the resemblance of conditions on the



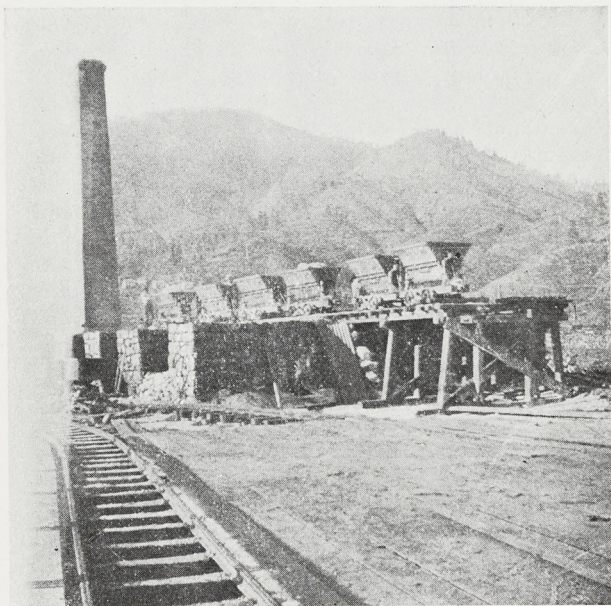
Piles of Copper Sulphide Ore from the Bully Hill Mine awaiting reduction at the De LaMar Bully Hill Smelter.

In the copper mines of Shasta County one hundred million dollars (\$100,000,000) worth of copper ore is now opened by tunnels and drills, ready for smelting.

Shasta May Blossom property as compared with the conditions found in these known properties is exact. Its footwall country rock is a granite porphyry, its hanging wall formation is slate, its outcroppings are a porous iron, the rock accompanying the croppings is rhyolite, and in every particular the geological conditions on the property of the Shasta May Blossom Copper Mining and Smelting Company are identical with the geological conditions found in its already splendidly successful producing neighbor, the De LaMar Bully Hill mine.

The Bully Hill and Shasta May Blossom properties are about twelve miles in an air line in an easterly direction from the nearest point on the California and Oregon division of the Southern Pacific railroad, and about twenty miles by wagon road from the city of Redding, in Shasta county. The properties are easy of access, as wagon roads lead directly to the mines. Surveyors are now engaged in surveying a route for a railroad to connect the district with the line of the Southern Pacific railroad, where connection will be made at a point about two miles above the station of Kennet.

In a measure a description of the Shasta May Blossom property involves a close reference to the Bully Hill property, and such reference should precede a description of the Shasta May Blossom property itself. On the Bully Hill property, therefore, we find these conditions: A slate formation lies to the east of the Bully Hill mine, this formation constituting the main body of the mountain east of the vein. Approaching the line of the Bully Hill vein, a rhyolite formation is encountered running parallel with the slate. West of this rhyolite formation the volcanic rock is found, this volcanic rock being granite-porphyry. These three leading formations parallel each other and preserve exact relation throughout the mountain. Near the contact of the



The Roasters of the De LaMar Bully Hill Smelter.

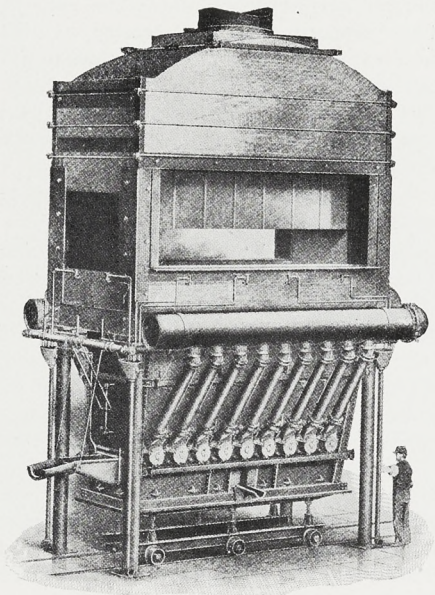
It is necessary to roast the ore before smelting in order that the sulphur may be driven off by heat, as the sulphur prevents the separation of the copper from the iron.

Shasta County has been producing copper for only six years, yet its output from two copper mines is now approximately \$8,000,000 per year.

rhyolite and the slate the porous iron or gossan croppings of the Bully Hill appear. These croppings were gold and silver bearing, and in the early operations of the property they were treated by different processes for the extraction of their values until deep work led into bodies of sulphide ores, which sulphide ores, though giving high assays, were, as already stated, beyond the knowledge of those operating the property, and the discovery of such ores and the inability to successfully treat them, led to the abandonment of the early work.

On the Shasta May Blossom property we find an exact counterpart of the conditions just observed in the De LaMar Bully Hill property, for passing from the easterly side of the Shasta May Blossom ground and going up the mountain side in a westerly direction, we cross a slate formation and enter the line of the granite-porphry formation and encounter our ore croppings identical with and not to be distinguished from the ore croppings of the Bully Hill property: and we find, too, that these ore croppings within the lines of the Shasta May Blossom property lie immediately against and parallel with rhyolite. Like the De LaMar Bully Hill property, on the surface the ore of the Shasta May Blossom property is a porous iron; like the De LaMar Bully Hill property this porous iron on the Shasta May Blossom property is gold and silver bearing; like it, this ore is paralleled by rhyolite; like it, the footwall formation is granite-porphry; the appearance of the veins is similar, their width and surface exposure approximately the same. Most careful consideration of all these different points as here set forth establishes the positive resemblance and close relation existing between the two properties.

The late history of the De LaMar Bully Hill mine dates from its purchase two years ago by Captain J.



A Modern Copper Furnace

In the furnace the copper ore is reduced to a molten condition, then passes into the fore-hearth or settling pot; the copper carrying with it the gold and silver values, sinks to the bottom while the iron and silica, in the form of slag, are drawn off from an upper opening and discharged as waste.

The United States produced 27,000 long tons of copper in 1880 as compared to a production of 286,000 long tons in 1900. The consumption of copper today is ten times as great as it was twenty years ago—thus insuring a market for an enormous production of the metal.

R. De LaMar, and within approximately sixteen months from the date of its purchase the smelter was in operation and producing bullion. Captain J. R. De LaMar has built a smelter of one hundred and fifty tons capacity, most perfect in construction; a railroad leading from the mine to the smelter; ore bins; offices; mine hoists and machinery; air compressors, etc. The smelter is treating about 5,000 tons of ore per month, with an output valued at more than \$200,000 per month,—the grade of the ore, therefore, being \$40 per ton, of which \$20 per ton is in gold and silver. Because of their heavy gold and silver values in addition to their copper values the ores in the east zone, in the immediate vicinity of the Bully Hill mine, are very much higher in grade than are the ores of the west zone, thereby making the ores of this particular territory practically independent of any fluctuations in the copper metal market.

In considering the probable output of the Shasta May Blossom property it is necessary for us to consider the grade of the ore in other mines in the district which have croppings similar to our own. The Mountain Copper Company's ores will average from \$20 to \$25 per ton, while the Bully Hill ores average \$40 per ton. As our property is adjacent to the Bully Hill property and on the Bully Hill contact, we would expect our ores to approximate Bully Hill values rather than Mountain Copper Company's ore values, and even if we strike a mean average between \$20 per ton and \$40 per ton we can reasonably expect our ores to be worth \$30 per ton, and it is not unreasonable for us to expect values equal to the values of the Bully Hill ores.

Within the boundaries of the Shasta May Blossom property there are two veins, but this report is confined more particularly to a discussion of the larger or east vein. On the west vein different cuts have



A Half-Million Dollar Pile of Copper-Gold-Silver Bullion, being the product of the first eighty days' operation of the De LaMar Bully Hill Smelter, in Shasta County, Northern California.

Four million one hundred and sixty-six thousand dollars (\$4,166,000) was the output from one Shasta County copper mine for the year 1900. The net profit from this one Shasta County copper mine for the year 1901 was eight times the purchase price of the property seven years ago.

been made, two of these being main discovery cuts running under cover, and showing the existence of the vein in place, with gossan ore throughout the vein matter. The main work on the Shasta May Blossom property consists of drifts and tunnels cutting the croppings of the larger east vein to actually prove the existence of the gossan vein below such croppings, preparatory to the deeper exploration of such gossan vein, which gossan, when found in place, is, in itself, in our district, a guaranty for pay ore at deeper levels. One of our tunnels when in 125 feet, 100 feet being under cover, cut a magnificent vein, containing ore and vein matter — the vein matter being a white talc or clay-like material, with bunches of gossan ore mixed through it, and on the footwall rests a solid body of gossan ore six feet in width. The total width of the entire vein is thirty feet from wall to wall. This late work is of very great importance to us because of the fact that it proves the close relation, in all details, of our vein with the vein of the neighboring great Bully Hill property, in which property at similar depth almost exactly similar conditions were encountered.

The croppings of the Shasta May Blossom property show boldly along the mountain side for a distance of over 500 feet in length, with a width of from 10 feet to 30 feet, and in addition, the vein is exposed at different points at least 1200 feet farther, giving a total length of vein showing on the property of nearly 2,000 feet. By comparison with results in the Bully Hill property, our bold croppings should give our largest ore body underground at least 800 feet in length and an average width of 15 feet. As the Bully Hill mine has already been developed showing magnificent pay ore at a depth of 500 feet, we therefore can reasonably expect ore will continue to great depth, and the unqualified success of our late work



Transporting the Bullion from Smelter to Shipping Point. Three thousand dollars (\$3,000) worth of bullion is hauled by each team.

Two copper mines of Shasta County produce half as much value as all of the gold mines of California combined.

increases the confidence in the splendid future of our company.

As bearing on all the matters discussed herewith, the report of Professor F. M. Anderson, read on December 30, 1901, at Berkeley, California, before the Cordilleran Section of the Geographical Society of America, may be quoted as follows :

“The copper deposits of Shasta County are of a grade and magnitude that entitle them to rank among the most important in the United States. They are repositories of ore that cannot be exhausted for many years to come.”

The Pacific Coast Miner, one of the leading mining journals of the United States, in its issue of March

1, 1902, says :

One of these promising properties that has attracted the attention of expert mining men and that is undergoing the exploration necessary to reveal the amount and value of what lies at a little depth, is the old Keith group of claims lying but a few hundred feet from the Bully Hill property, and but a half mile from the town of De LaMar. The property belongs to the Shasta May Blossom Copper Mining and Smelting Company. Here are wide gossan cappings continuing for nearly half a mile, carrying gold and silver, and providing the same indications of what is below as do the gossans of Bully Hill. The cuts and tunnels that have so far been opened reveal veins of precisely the same nature and at the contact of the same formations as in the Bully Hill mine. One of the veins is thirty feet wide and a tunnel has already revealed a fine ore body.

This property will attract special attention from now on both because of its active development and because of its proximity and similarity to its great



Loading the Half-Million Dollar Pile of Copper, Gold-Silver Bullion, from the De LaMar Bully Hill Copper Mine, Shasta County, Northern California, for Shipment to the Eastern Refineries.

At the refinery the bullion is passed through an electrolytic process wherein the gold and silver is separated from the copper, and the copper is run into bars, in which form it is sold to the manufacturer of copper wares.

A Shasta County copper property purchased six years ago for \$10,000 is now producing that amount every thirty-six hours.

neighbor, the Bully Hill. About six months ago it was secured by Morton Lindley, a well known mining and metallurgical expert, on behalf of himself and associates and for some time Mr. Lindley has been pushing exploration, guided by what is known of the formations, including veins and ore bodies of the Bully Hill. Cuts and tunnels have been run to determine the width, dip, etc., of the vein and the results so far have given most encouraging promise that a valuable mine will be developed.

From the Redding Daily Free Press, we quote :

Morton Lindley, the mining expert and representative of capitalists, came in from De LaMar at midnight Thursday after having concluded an important deal by which his company secures the Keith group of copper claims. The speedy and thorough development of these copper mines by men prominent in the mining world will follow.

This deal marks the entry into the Shasta Copper field of the Shasta May Blossom Copper Company.

Mr. Lindley, who familiarized himself with Shasta County by mining all over it from 1889 to 1892, thinks the true greatness of the copper belt is entirely unappreciated as yet. In speaking of Captain De LaMar's operations at Bully Hill he said : "De LaMar now owns two miles of ground there. The Bully Hill mine producing over two millions a year with its little 150-ton smelter is but a fractional part of De LaMar's possessions. His copper holdings between Bully Hill and Pitt river should eventually produce more than five million dollars annually."

And Morton Lindley is a man who does not make statements which he cannot substantiate.

The Morning Searchlight of Redding, Shasta County
California, says :

“The Shasta May Blossom mine near De LaMar looks fine and is pronounced as being gossan carrying a white quartz. Many eyes are upon this property and to almost all miners here things look mighty good. Morton Lindley is the superintendent.”

The prominent mining journal of Northern California
Mineral Wealth, in its issue of Jan. 1, 1902,
has the following :

“Iron Mountain paid its first dividend of 5 per cent on a capital of \$6,250,000 with copper at less than 9 cents per pound, and with a plant which at its best could not be compared with the present equipment. Shasta County copper can pay big dividends when many mines, at present large producers, would be forced to close down. The gold and silver contents in most cases will pay for the extraction, and in the case of the Bully Hill ores will pay a handsome profit, leaving the copper contents as profit or additional profit.”

From the editorial columns of the San Francisco Chronicle
of October 14, 1901 we quote :

CALIFORNIA'S BASE METAL ERA.

For nearly half a century California neglected nearly every mineral resource it possessed except gold. It was content to be known as the Golden State. It clung tenaciously to the traditions of “the days of old, the days of gold—the days of '49.” Capital sought investment during this period in few

other than gold-bearing properties. The base metals were neglected. It was a foreign corporation that entered one of our gold-mining counties and demonstrated the fact that one base metal proposition was worth four times all the gold mines in the county combined. Previous to this development gold mining was Shasta's main industrial resource. It embraced a long list of small productive properties, but their joint annual yield amounted to less than \$900,000. The base metal product of the Mountain Copper Company raised it to over \$5,500,000 a year. This year another base metal mine in the neighborhood has turned out over a million dollars' worth of bullion in five months and the county's mineral output promises to reach, if not exceed, \$8,000,000 by the close of the year.

This is the development in base metal working of only one of the State's smallest counties. It is worth noting that both of the big base metal mines which have added so much in so brief a period to the wealth of this one county passed through a precarious experience as bearers of precious metals. The Mountain Copper mine was regarded for years as a moderately low-grade gold deposit in rebellious combinations which complicated the reduction of the ore and depreciated its value. The Bully Hill group, on the other hand, was worked in 1887 for silver. It contained then from \$3 to \$8 per ton in gold, but silver predominated, and in 1887 \$180,000 of silver bullion metal was extracted as the result of the year's work. It was actually in the market subsequently for \$10,000. Now as a base metal mine it promises to yield this year at least \$2,000,000 and possibly more. As a base metal mining county it is estimated that Shasta will this year yield about \$8,000,000, nearly ten times what it yielded as a gold producer, and next year there is good reason to believe that its mineral

output—almost all base metal—will aggregate \$12,000,000.

Without, therefore, diminishing its gold production, California promises in future to alter the relationship of that metal to the base metals, and will assign to it a secondary place in the list of mineral productions. A vast territory heavily mineralized with base metals is in a virgin condition. The prospector has passed by enormous masses of outcroppings hitherto without giving them a serious thought. His mind was bent on the yellow metal. He never suspected that these base metal deposits, properly handled, were of greater value than any gold mine in the State. Such is, however, the proven fact, and it looks as if the future status of California as a mineral producer will be determined more through the working of these base metal deposits than through the most thorough exploitation of its gold-bearing quartz ledges. It does not need a vivid imagination to conjure up a picture of the effect of this new mineral development on industry and commerce in general.





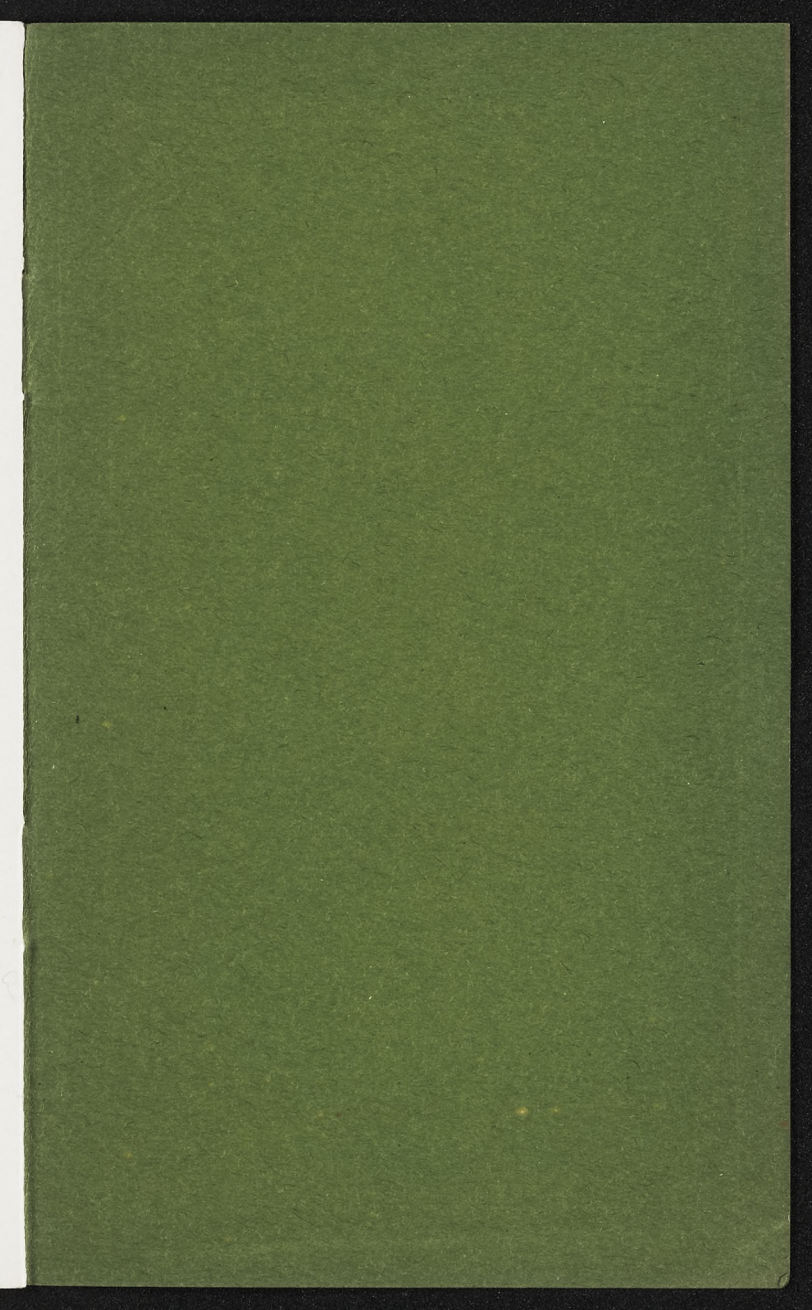
For Illustrated Descriptive Matter and Further Information
Regarding the Great Shasta County Copper Belt
in Northern California, address

=====*The*=====

Standard Investment Company

*Hayward Building, 488 California Street
San Francisco, California*

=====
*The Shasta May Blossom Copper
Mining and Smelting Company*





*The property of the Shasta May Blossom Copper Mining and Smelting Company.
**The De LaMar Bully Hill Smelter, which has produced two and one-half million dollars within the past year.